RESEARCH PLAN PROPOSAL

A study of Integrated Water Resource Management Project: With special reference to Rajasthan

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Introduction:

Water is a scarce resource that is exploited most carelessly, and managed most ineffectively. Rajasthan is the largest State of the country and the status of water availability in the state is most critical. As per report by Central Ground Water Board (2010), Rajasthan with more than 10.4% of the country's geographical area; supporting more than 5.5% of the human population & 18.70% of the livestock has only 1.16 % of the total surface water available in the country.

Out of the total 142 desert blocks in the country, 85 blocks are in the State of Rajasthan. Out of 249 blocks in the state, only 30 blocks are in safe category. The average annual rainfall ranges from 100 mm in Jaisalmer to 800 mm in Jhalawar while the average annual rainfall of the state is 531mm. The state has also witnessed frequent drought and famine conditions in the past fifty years.

The per capita annual water availability in the state is approximately 780 cubic meter (cum) against minimum requirement of 1000 cum while it is feared that the availability would fall below 450 cum by the year 2050.

As per the international accepted norms, availability of water below 500 cum is considered as absolute water scarcity. (add source), make a paragraph

Considering the gloomy situation of water resource management, government of Rajasthan took some major initiatives to deal with the issue.

The foundation of sustainable development in terms of water resource management is presently in a colossal dilemma in the state of Rajasthan. The inclusion of the concept of Integrated Water Resource Management (IWRM) in state water policy of 2010, the concept acknowledged in 1992,

in the Agenda 21 of the famous Rio Summit, is termed to be a remarkable step towards dealing with the water governance issue in Rajasthan.

IWRM maintains that sustainability dilemma is best answered through ownership; ownership of property, of duties, of rights, of resources and most importantly ownership of problems and their solutions. The graft associated between the aforementioned statement and the water resource management is the reason for conducting the study.

The study pertains to Integrated Water Resource Management because it is one of the most significant steps taken to recuperate the institutional thickness and improve societal involvement in terms of adapting effective water governance model of Rajasthan.

The Global Water Partnership (2000) defines IWRM as "a process, which promotes coordinated development and management of water resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems".

Review of Literature:

David, *et al.* (1990) in their paper explained Hardin's 'Tragedy of Commons' model that predicted the eventual overexploitation or degradation of all resources used in common. Their study illustrated that there were a number of cases in which users have been able to restrict access to the resource and establish rules among themselves for its sustainable use.

Authors first defined common- property resources and the taxonomy of property-rights regimes in which such resources may be held. The conclusion of unavoidable tragedy followed from assumptions of open access, lack of constraints on individual behavior, conditions in which demand exceeds supply, and resource users who are incapable of altering the rules. This paper explained the application of concepts of human behavior about common property access and ownership.

Vermillion (1994) states basics of a conducive environment, which is needed to help water-using associations manage water. He mentioned that, foremost, an effective institutional structure and a supportive policy environment would make WUAs accountable with clear recognized responsibilities, authority and incentives to ensure water rights. Secondly he stressed upon economic viability, which further depends upon profitability or at least recovery of agricultural enterprises along with the development of effective irrigation infrastructure and technology. Lastly, he stated it was vital to secure adequate resources and capacities for financial, human resources and local management.

Meinzen et. al (1997) reviewed female participation in water user associations in India and stated that there female participation remains low despite high involvement in agricultural decision making and official

policy statement, that calls for gender equity. They stated that participation can be measured by two factors; rules of membership (which determines eligibility to participate) and balance of costs and benefits derived from involvement which influences individuals decisions to participate.
Basing on aforementioned participating factors, they concluded that women participation is constrained because of high opportunity cost of time of involving into organizational work, given their high domestic and productive workloads.

Meinzen & Zwarteveen (1998) studies the considerable rhetoric about women's participation and asserts that there is limited understanding of the differences between the needs and priorities of women and men with regard to water resource use, and of the barriers women face in achieving control over resources, even in local organizations that ostensibly seek improved access for all. They realized that a major hurdle in development of this understanding is lack of recognition of women's resources and management need as legitimate. Congruence of interests between men and women mostly assumed, although evidently women usage pattern of water is much different than that of men.

Pangare (2002) in his paper provided a detailed provision of the management transfer of water resource management in different states of India. His assessment of various case studies was based on following grounds; efficiency of water use, water distribution, area under irrigation, impact on agriculture, improved maintenance and collection of water. Based on following grounds he concluded that situation in Maharashtra, Tamil Nadu, Haryana, Kerala and Bihar has improved in terms of

maintenance and efficiency of water. While collection of water charges was not effective in Gujarat due to lack of organizational capacity and lack of awareness. There was slight improvement in area under irrigation during post reform period, while the distribution of water still remained inadequate in most states.

Mathur & Thakur (2003) conducted the study on urban water services across India using the data drawn from Bangalore, Vodadara, Allahabad and Agra. The data from other on-going studies on the financial structures of municipalities and city-specific agencies responsible for water provision was also taken.

The study laid out a framework for pricing reforms in the water sector. It was concluded that although the macroeconomic consequences of low water prices are difficult to assess, urban water services could cost the state governments the equivalent of 0.3 to 0.4 per cent of their gross domestic product.

The major conclusion of the paper was when water tariffs are lower than the cost of provision, there was little incentive to expand the service, and fewer resources are allocated to water than would be optimal.

Biswas (2004) discussed about integrated and direct management of sectoral and aggregate water demand, something that is absent in most developing countries. As distinct from the supply-side focus of public policy action in water sector - of governments as well as donors - on "developing" the resource by investing in infrastructure, the study emphasized the need to embrace demand-side management.

Singh, *et al.* (2004) quantified the virtual water trade through cross trading of commodities in different regions of Gujarat and its effect on the availability of water required for consumption across the state.

This study estimated that dairying-based rural livelihoods systems were threatening the limited water resources of arid and semi-arid areas, and their future in turn is threatened by the depletion of these resources.

The paper analyzed virtual water exports and imports by some of the leading dairy cooperatives of Gujarat. The paper concluded that virtual water import in the form of feed and fodder is one of the options to reduce the pressure on irrigation water in water scarce north and Saurashtra.

Wouters, et al. (2004) studied in their book pre – requisites of socio - economic aspects implementing Integrated Water Resources Management in Central Asia. They have stated some international best practice of IWRM like IWRM-Ferghana Project, IWRM in the Amudarya River Basin and IWRM in the Syrdarya River Basin. The book addressed the need for Integrated Water Resources Management at the regional level.

Cullis & Van Koppen (2005) analyzed the inclusion of IWRM concept in the National Water Policy of some African nations like Tanzania. Basis of this inclusion as suggested by the study were international agencies and global thinking rather than analysis of local context and need. Tanzania included state ownership of water resources, water withdrawal permits, water tax, legal institutional reform, river basin organizations, water user associations (WUAs), but no attempt was made to include what its people needed more and restoration of local infrastructure models.

As a result, towards the end of implementing phase of the IWRM project the leadership analyzed that reforms could not deliver what Tanzania's rural communities need badly, i.e. better domestic water supply systems, improved irrigation water control and better hydraulic infrastructure than water withdrawal permits, water pricing and catchment organizations.

Shaw & Koppen (2006) adduced cross-country evidence to show that water poverty of countries has little to do with scarcity of water endowments, but everything to do with the growth and maturity of a country's economy. They reviewed the experience of donor-induced IWRM in Asia and Africa, which suggested that these initiatives have done little good, and even some harm in many of these countries.

The most significant impression that emerged was that, wherever these were tried, the IWRM-style reforms came unstuck. Implementing water pricing and water withdrawal permits proved administratively challenging.

The chief reason was that in predominantly informal water economies of poor countries, majority of water users depended either on self-provision of water or local informal institutional arrangements. Making direct demand management work in such situations was close to impossible.

The IWRM paradigm of direct demand management was not wrong, but it was infeasible in informal water economies. The rise of a class of intermediaries between users and natural sources of water- in the shape of water service providers - was a precondition to meaningful demand management.

Somanathan & Ravindranath (2006) conducted a pilot study that showed that it was feasible to obtain comparable measures of water prices and water demand elasticity. The paper provided a methodology to derive water

demand curves and gave an effective model to understand endogenous and exogenous variables affecting water price determination.

Comparable measures derived from this model were used to examine the efficiency of water allocation in drinking and irrigation systems across the study area. They will be an important input for studies that seek to examine the gains from improved water allocation and management.

Kidd & Shaw (2007) argued that there was much to be gained by developing stronger links between spatial planning and IWRM from both a conceptual perspective and operationally, in a holistic context.

Through this paper developed an understanding of critical inter-connections between water demand, water management and water institutions.

It brought to light the inadequacies of existing management arrangements and threw light at the lack of effective planning and management at the catchment level through some of the typical examples of poor water governance across the world.

Sen et. al (2007) studied the issue of property rights and usufruct rights, along with procedural ambiguity of streamlining the process of community management of water resource management. They assumed that water users using funds from the village panchayats carrying out repairs and maintenance, such efforts were seldom made.

The whole idea of O&M being managed by the community in a successful manner hinged on one question of source sustainability and availability of concentrated funds at disposal of managing committee of collectively help water resources.

Stalnacke & Gooch (2010) stated that besides creating additional water resources facilities for various uses, adequate emphasis should be given to the physical and financial feasibility of existing facilities.

The paper pressed on the need to ensure that the water charges for various users should be fixed in such a way that they cover at least the operation and maintenance charges of providing the service initially and a part of the capital cost subsequently. These rates should be linked directly to the quality of service provided.

The study also threw light on water subsidy factor and maintained that subsidy on water rates to the disadvantaged and poorer sections of the society should be well targeted and transparent.

Motivation/ Justification and Relevance:

The EU-State Partnership Program (EU-SPP) between the Government of India and the European Union (EU) is a six-year (2006-2013) multi-sector policy support program aimed at poverty alleviation in the states of Rajasthan and Chhattisgarh. The SPP (Rajasthan) is providing strategic long-term support to the Government of Rajasthan (GoR) as it pursues an innovative sector reform program aimed at tackling Rajasthan's water-related challenges. The SPP (Rajasthan) is playing a pivotal role in the implementation of the GOR's new State Water Policy (SWP) and State Water Policy Action Plan (SWPAP) through IWRM.

The State water Resources Planning Department (SWRPD), with the assistance of the EU-SPP piloted a local-level planning process for IWRM in 11 Districts and 82 blocks.

The project is presently in third phase of its implementation and this research aims at undertaking a comprehensive assessment of effectiveness of its proposed strategy of work as per ground realities of Rajasthan, understanding the rationale behind an extensive mid term expenditure framework of this project and assess the socio – economic changes in terms of water availability and management that IWRM proposes to bring about in lives of people.

Objectives:

- To evaluate the extent of synergy among various stakeholder organizations, mainly various government departments involved in water resource management in the state
- To evaluate the effectiveness of the activities based on regional requirements, inclusion of available social capital and understand the change in participation of people in local water resource management.
- To assess the investment component of the IWRM plan executed in Rajasthan
- To assess whether availability of water has improved in qualitative and quantitative terms

Hypotheses:

- Null hypothesis (Ho): There is no significant difference in the availability of water to the people before and after implementation of the IWRM project.
- Alternate hypothesis (Ha): There is a significant difference in the availability of water to the people before and after implementation of the IWRM project.
- Null hypothesis (Ho): There is no significant change in the water management methodology in Rajasthan after implementation IWRM plan.
- Alternate hypothesis (Ha): There is significant change in the water management methodology in Rajasthan after implementation IWRM plan.

Plan of Work and Methodology:

In the proposed research work a conceptual methodology is devised to be able to analyze every major aspect of the IWRM project. It is important to comprehensively examine the social and economic worth about significant benefits that flow in from different development actions of this project; along with the evaluation of the negative externalities associated with them.

The critical evaluation approach of IWRM will combine methods of documentation study (desk research) and primary survey (interviews and field visit).
The secondary data source will majorly be literature developed on IWRM by various agencies, state water policy of 2010, and other reports of the various government departments.

For primary data source, questionnaire/ structured schedules will be prepared for the following three groups:

- Village Water Health & Sanitation Committee (VWHSC) members;
- Head of households of Gram Panchayats, where IWRM is been implemented;
- Government of Rajasthan officials and EU committee members who are involved in implementation of IWRM in Rajasthan (through interviews)

Sample Size

The universe for primary data collection is population of 82 blocks of 11 districts of Rajasthan where IWRM is been implemented.

- Sample size of 50 VWHSC committees will be included in primary survey, which is about 7% of all VWHSCs formed under IWRM.
- Sample size of 500 households from amongst GPs where IWRM is implemented

Primary survey will be pertained to two districts of all the eleven districts that will be chosen from amongst Jaipur, Jodhpur or Bikaner (districts where baseline survey was conducted before implementation of IWRM by (GoR) on the basis of lottery system, to make the before and after comparison possible.

Selection of Sampling Units

- While covering stakeholder from every social division of VWHSC, a uniform sample design of Purposive Sampling Technique shall be adopted.
- For selecting sampling units (beneficiaries of various activities of schemes) in various blocks, after implementation of IWRM, stratified random sampling technique shall be applied.

Preparation of Detailed Schedule of Survey

After mapping all selected units, detailed survey schedule shall be finalized which will be comprised of close ended questions and will be in form of structured questionnaire.

Analysis of Data

Various Economic and Social analytical tools will be incorporated to include less quantifiable and non-monetizable factors into basic cost based analysis framework, which also include political and broad social objectives of the activities performed.

On the basis of findings from desk and primary research, overall evaluation and comparative analysis of the activities of various outcomes, progress and achievements will be tested against following evaluation criteria:

(i) **Relevance** – the extent to which the activity is suited to local and national development priorities and organizational policies, including changes over time.

(ii) **Effectiveness** – the extent to which an objective has been achieved or how likely it is to be achieved.

(iii) **Efficiency** – the extent to which results have been delivered with the least costly resources possible.

(iv) **Results/impacts** – the positive and negative, and foreseen and unforeseen, changes to and effects produced by a development intervention.

(v) **Sustainability** – the likely ability of an intervention to continue to deliver benefits for an extended period of time after completion.

Chapter Scheme:

- Introduction
- IWRM concept and historical reference
- Comparison of IWRM model implemented in Rajasthan and other parts of the world
- Congruency between objectives of State Water Policy of 2010 and IWRM principles of Rajasthan
- Impact of IWRM on water management ideology of Rajasthan
- Suggestions & Conclusion

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